CLAIMS

1. A doctor blade having a long axis for application against a circumferential surface of a roll rotating upon a rotational axis, comprising a composite material comprising a plurality of abrasive unidirectional fibers impregnated with a resin.

2. The doctor blade of claim 1 wherein the doctor blade has a laminate structure comprising multiple layers of said composite material.

3. The doctor blade of claim 1 wherein the unidirectional fibers are selected from the group consisting of fiberglass, ceramic, and mixtures thereof.

4. The doctor blade of claim 3 wherein the unidirectional fibers comprise fiberglass.

5. The doctor blade of claim 1 wherein the unidirectional fibers comprise predominantly long continuous fibers.

6. The doctor blade of claim 1 wherein the unidirectional fibers are provided in a unidirectional fabric and at least 60% by weight of the unidirectional fabric comprises unidirectional fibers.

7. The doctor blade of claim 6 wherein at least 75% by weight of the unidirectional fabric comprises unidirectional fibers.

8. The doctor blade of claim 7 wherein at least 90% by weight of the unidirectional fabric comprises unidirectional fibers.

9. The doctor blade of claim 6 wherein the unidirectional fabric further comprises secondary fibers.

10. The doctor blade of claim 9 wherein the unidirectional fibers have diameters equal to or greater than the diameters of the secondary fibers.

11. The doctor blade of claim 10 wherein the diameters of the unidirectional fibers are about 450 to 1500 μm and the diameters of the secondary fibers are about 400 to 700 μm.

12. The doctor blade of claim 6 wherein the unidirectional fabric further comprises nonabrasive fibers.

13. The doctor blade of claim 12 wherein the nonabrasive fibers are selected from the group consisting of carbon, rayon, aramid, polyester, and mixtures thereof.

14. The doctor blade of claim 13 wherein the nonabrasive fibers comprise carbon fibers aligned in a direction substantially perpendicular to the long axis of the doctor blade.

15. The doctor blade of claim 6 wherein the unidirectional fabric has a weight per unit area of about 230 to 610 g/m^2.

16. The doctor blade of claim 1 wherein the resin comprises a thermoplastic resin.

17. The doctor blade of claim 1 wherein the resin comprises an epoxy resin.

18. The doctor blade of claim 1 wherein the resin has a glass transition temperature of about 65 to 315 °C.

19. The doctor blade of claim 18 wherein the resin has a glass transition temperature of about 85 to 315 °C.

20. The doctor blade of claim 1 wherein the resin further comprises an abrasive additive selected from the group consisting of glass microspheres, glass fibers, crushed glass, synthetic or industrial diamond particles, silica particles, silicon carbide particles, boron particles, zirconium particles, aluminum oxide particles and mixtures thereof.

21. A method of cleaning a circumferential surface of a roll rotating upon a rotational axis comprising the steps of:

a) positioning a doctor blade having a long axis near the roll surface such that the long axis of the doctor blade is substantially parallel with the rotational axis of the roll, the doctor blade comprising a plurality of unidirectional fibers impregnated with resin; and

b) pressing a beveled edge of the doctor blade against the surface of the roll.

22. A method of decreasing the roughness of a circumferential surface of a roll rotating upon a rotational axis comprising the steps of:

33. A method of claim 31 or 32 further comprising curing the resin by subjecting the impregnated composite material to an elevated temperature and pressure.

34. A method of claim 33 further comprising cutting the cured composite material into 2 or more doctor blades.

35. The method of claim 31 wherein the unidirectional fibers are selected from the group consisting of fiberglass, ceramic, and mixtures thereof.

36. The method of claim 35 wherein the unidirectional fibers comprise fiberglass.

37. The method of claim 31 wherein the unidirectional fibers comprise predominantly long continuous fibers.

38. The method of claim 31 wherein the unidirectional fibers are provided in a unidirectional fabric and at least 60% by weight of the unidirectional fabric comprises unidirectional fibers.

39. The method of claim 38 wherein at least 75% by weight of the unidirectional fabric comprises unidirectional fibers.

40. The method of claim 39 wherein at least 90% by weight of the unidirectional fabric comprises unidirectional fibers.